

CASE STUDY

Argonne "Cleans Up" Oil Changes

Waste Reduction and Recycling Address Environmental Concerns

Oil changes can be a messy business, resulting in used oil and filters that need to be discarded safely. Argonne National Laboratory's Vehicle Maintenance Group changes the oil in three to five vehicles each day, but they keep it clean by:

- Revising the preventive maintenance schedule so that mechanics perform two oil changes per year instead of four;
- "Closing the loop" by recycling used oil and using rerefined oil;
- Draining, crushing, and recycling used oil filters as scrap metal.

By following these procedures, Argonne is preventing pollution, minimizing waste, and



complying with federal requirements.

Why Rerefine Used Oil?

Used oil can contaminate air, water, and soil. It's insoluble, persistent, and slow to degrade. It may also contain harmful contaminants that result from engine wear, combustion, and additives. Because improperly handled used oil can damage the environment, the U.S. Environmental Protection Agency (EPA) has established regulatory guidelines for its management.

The good news is that oil can be reused again and again: it doesn't wear out; it just gets dirty. Rerefining removes particles, combustion products, and additives. One gallon of used oil can be rerefined into 2.5 quarts of motor oil, saving the 42 gallons of crude oil needed to make the same amount of virgin oil. Rerefining used oil also requires less energy than refining crude oil.

The Resource Conservation and Recovery Act continued requires that federal agencies and government contractors purchase certain items containing recovered materials. Rerefined oil is one of these items. Executive Order 12873 requires federal agencies to purchase rerefined oil when appropriate.

How Can Oil Filters Be Recycled?

The EPA allows oil filters to be excluded from hazardous waste regulations if they meet three criteria:

- They are not coated with tin-lead alloy (known as terne).
- They are not mixed with any other hazardous waste.
- They are drained of oil.

Removing the oil from a used filter allows the metal to be recycled as nonhazardous metal scrap.

How Oil Changes Are Performed

The Vehicle Maintenance Group's oil change procedures comply with federal regulations and result in a cleaner operation.

Previously, each lightduty pickup and sedan received four oil changes per year: one every three months or 3,000-4,000 miles. However, these vehicles are driven an average of only about 500 miles every six months because they are used primarily for short, onsite trips. Therefore, the Vehicle Maintenance Group changed the preventive maintenance schedule so that lightduty vehicles receive only two oil changes per year. This schedule modification halved the amount of waste generated by oil changes, and no adverse effects on the vehicles have been observed.

When a vehicle requires an oil change, the Vehicle Maintenance Group replaces used oil with rerefined oil and recycles the old oil. Rerefined motor oil is purchased from the Defense Supply Center in Richmond, Virginia.

Previously, Argonne treated oil filters as hazardous waste, requiring special handling by an off-site contractor. Argonne now separates the oil from the metal in the filters, and both components can be recycled.

 After a filter is removed from a vehicle, it is drained for at least 36 hours to remove residual oil.

Refined oil:

- Preserves the environment for humans and wildlife,
- Recovers and conserves fossil fuel resources,
- Reduces dependence on foreign oil, and
- · Costs less than virgin oil.

Recycling oil filters:

- · Recovers more recyclable oil,
- · Preserves landfill space, and
- Reduces costs because filters no longer need special handling as hazardous waste.
- The filter is crushed by a pneumatically operated heavy-duty crusher.
- As the filter is crushed, the pressure removes the remaining oil, which is then caught in a holding container.
- All residual oil is then placed in the waste oil storage tank to await pickup by an off-site contractor, who then recycles the oil.
- The metal from the filter is recycled as scrap.

Disclaimer
This information on the pollution
prevention measures employed
by the Vehicle Maintenance Group
at Argonne National Laboratory
is intended as guidance only.
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